General Comments:

1. A sediment Effects Range Medium (ERM) is not a suitable threshold for screening ecological risk. Since an ERM represents the 50th percentile concentration for the ranked sediment Chemical of Potential Ecological Concern concentrations associated with a biological effect, it marks the point above which effects become probable and is not a very protective metric for risk, particularly at the screening level. However, further knowledge of potential sediment cumulative toxicity can be gained by looking at ERM values in combination as a mean quotient in multiple contaminant sites such as this. As such, an ERM quotient would be a more reliable indicator of the potential for risk to exposed ecological receptors. Therefore, we conducted a brief ERM-Quotient analysis by selecting five sediment sample locations from the north marsh area representing different mixes of COPECs and concentrations using Figure 13 from the Nature and Extent Draft Report, dated March 2, 2009. The results of this analysis (as presented in the related specific comment below) indicate a probability of toxicity to the benthic community in four of the five samples.

2. Further evaluation of the benthic community within a Baseline Ecological Risk Assessment is warranted. This is indicated by the exceedance of TCEQ PCLs and second effects levels for protection of the benthic invertebrate community, the use of 95% Upper Confidence Limits in a SLERA, and the lack of a spatial analysis of the sediment data in relation to evaluation of the benthic community. Additionally, based on the outcome of the mean ERM-Quotient analysis (discussed in the related specific comment), our previous comments on bulk sediment toxicological testing and the development of a sediment toxicity work plan apply.

3. Dose calculations for the coyote, hawk, and green heron only take into account the dose from food ingestion and not soil (sediment) ingestion. A statement is made in the document that these doses have not been included because the proportion of incidental soil ingestion relative to food ingestion is small (2%). While the dose proportion may be small, it is important to take into account chemical dose from the incidental soil ingestion. Dose is a function of not only ingestion rate, but also of chemical concentration in the material ingested. Because concentrations of some chemicals are likely to be much higher in soil than in food, a disproportionate dose can come from soil. It is necessary to include the incidental dose from soil to the coyote and hawk, and sediment to the green heron in the dose calculations.

4. Dose calculations have intermingled wet-weight ingestion rates with dry-weight food concentrations. Food ingestion rates presented in Chapter 5 from EPA (1999) are based on wet weight, but the food concentrations calculated are in dry weight. This will tend to significantly overestimate the chemical dose from food. Either the ingestion rate or the food concentration should be corrected for percent moisture, which can be found in either EPA (1999) or EPA (1993).

5. There are missing dose calculations for selected COPECs identified in Table 21. Acenaphthylene, dieldrin, endrin, and endrin ketone are shown as COPECs in North Area Soil in Table 21, but concentrations of zero have been entered into the Appendix D dose calculations, resulting in perceived acceptable risk. For the Intercoastal Waterway Sediment, Appendix G shows a concentration of zero for low-molecular-weight polycyclic aromatic hydrocarbons (LPAHs), but LPAHs are listed as a COPEC. For the

Pond Sediment, Appendix I presents no concentration for LPAHs, and phenanthrene, which has been identified as a COPEC in Table 21, is not included in the risk calculations.

6. In all instances where no readily available bioaccumulation factor (BAF) or biota-sediment accumulation factor (BSAF) was available, a food concentration of zero was incorporated into the dose calculations. The absence of a BAF does not preclude the potential for bioaccumulation of the chemical into food. Assuming a food concentration of zero will minimize the dose and likely underestimate potential risks. If appropriate accumulation factors cannot be derived from the scientific literature, a default BAF of 1 should be adopted, with the soil concentration normalized to wet weight of the food item organism and incorporated into the dose calculations. This is consistent with standard methodology adopted by the EPA for screening level applications (i.e., EPA 2005).

7. As noted in Table 21 and discussed elsewhere, "Surface water is not included in this table because they were evaluated differently given the lack of screening criteria and toxicity reference values." The WQC can be used to directly assess potential risks to the fish receptors (black drum and spotted sea trout) and the fiddler crab. Consequently, surface water comparisons to WQC should be added and treated as appropriate TRVs in the document.

8. Background Comparisons: The following statement is made in Section 2.7: "EPA guidance for conducting SLERAs (EPA, 2001) recommends that comparison with background generally not be used to remove compounds from further evaluation in order to conservatively ensure that site risks are adequately characterized. This recommendation is based on the premise that the SLERA is often conducted on limited data set prior to a comprehensive site characterization." Subsequently, the background comparison is used to eliminate contaminants of interest (COI) from the COPECs. The exact language from EPA (2001) is as follows: "While contaminants of concern may be removed from further assessment through comparison with toxicological benchmarks, comparison with background levels generally cannot be used to remove contaminants of concern owing to the need to fully characterize site risk. Such comparisons, however, can be used effectively to focus the baseline risk assessment, if needed." The clear implication of this guidance is that the elimination of COPECs based on the background comparisons discussed in this section is not appropriate. All COIs should be carried through into Step 2

9. All review comments shall be addressed in a response prior to or as an accompaniment to the next review document.

10. Figures (maps) previously generated showing sample locations with hazard quotients > 1 shall be included with this document. By showing these on a map, reviewers would be able to make a determination as to concentration gradients and/or hotspots.

11. An Executive Summary and a list of acronyms shall be included with the SLERA.

Specific Comments:

1. P. 13, Section 2.5.3 Measurement Endpoints: Surface water should also be listed here. Also, only one measurement endpoint has been identified: comparison of soil, sediment, and surface water concentrations to appropriate ecological benchmarks. This

measurement endpoint only applies to protection of fish and shellfish, soil invertebrates, and benthic organisms. A second measurement endpoint applies to the mammalian and avian food web dose calculations and comparison with TRVs.

2. P. 16, Section 2.6.2 Sediment and Tables 6-9: There appears to be some confusion over the terminology regarding TCEQ's sediment benchmarks. The midpoint value between the initial and second effects level benchmarks is considered to be the default sediment PCL for protection of the benthic community for a particular COPEC. As stated in the related general comment, site COPEC sediment concentrations should not be compared to the second effects levels (most of which are ERMs) as these are probable effects levels.

3. P. 21, Section 3.1.1 Terrestrial Receptors: It is important that small mammalian receptors of various feeding guilds be represented in a SLERA because of their potential to maximize exposure through their small body weight and narrow home range and because they serve as primary food sources to other receptors. Therefore, it is preferred that both an omnivore that eats mostly invertebrates (e.g., Least shrew) and a herbivore that eats mostly plant matter (e.g., Deer mouse, White-footed mouse) be evaluated as opposed to a single omnivore that eats 50% invertebrates and 50% plant matter. The Least shrew's diet should be evaluated as 90% invertebrates, 10% plant matter, and 8% incidental soil ingestion and the herbivorous mammal's diet should be evaluated as 90% plant matter, 10% invertebrates, and 2% incidental soil ingestion (see the related specific comment).

4. P. 25, Section 3.2 Screening-Level Exposure Estimates: The second sentence of the first paragraph ("For second order carnivorous fish…") needs to be explained and/or clarified. This statement is not reflected in the conceptual site models (Figures 4 and 5) nor does there appear to be any indication that Toxicity Reference Values (TRVs) were based on tissue data. Also, the methodology and results of the fish measurement receptors evaluation should be clarified with the text.

5. P. 27, Section 3.2 Screening-Level Exposure Estimates and related appendices: Regarding incidental soil ingestion, the percent soil ingested can be calculated by dividing the soil ingestion rate by the food ingestion rate, assuming both are in the same units and moisture content (wet weight vs. dry weight). This calculation revealed that the soil ingested by the Deer mouse (0.2%) and the Robin (3.2%) is substantially lower than it should be. It is understood that these rates were obtained from traditional sources for ERA inputs. Nevertheless, these percentages should be higher (2.0% and 5.2%, respectively). All other incidental soil/sediment ingestion percentages for the other evaluated receptors appear reasonable.

6. WQC qualify as benchmark screening values, and shall be presented similarly to the hazard quotient presentations for all other media. While it is true that dietary exposure to contaminants is not considered in WQC, the direct toxic effects to aquatic organisms are better assessed by incorporating gill uptake and direct contact as exposure pathways, which is what has been used to establish the WQC. Further, the extensive discussion based on the concentration in water having 50% chance of causing death to aquatic life, or LC_{50}, related to these contaminants is not appropriate; evaluation of toxicological data based on chronic endpoints is more appropriate. The LC_{50} discussions shall be replaced with the more appropriate chronic endpoints.

7. P. 42, Section 5.1.1 Soil and Sediment and Table 8: TCEQ (2005) guidance appears to have been misused to screen out dibenzo(a,h)anthracene. As this COPEC exceeds its second effects level, it should be retained beyond screening to ensure that disproportionate concentrations within the mixture are not masked by the total. Also, as naphthalene was not included in the list of chemicals of interest in Table 8 and as it is one of the thirteen parent PAH compounds, it is appropriate to use a proxy value for it in order to correctly utilize the Total PAH benchmark (TCEQ, 2006).

8. P. 44, Section 5.3 Scientific Management Decision Point: We do not concur with the conclusion that adverse ecological risks are unlikely. As part of the SLERA review, select surface sediment data for the marsh area north of Marlin Ave. was evaluated through the mean ERM-Quotient approach as described in Long, et al. (1998). When evaluating the resulting quotients using the methodology of Long and McDonald (1998), the resulting probabilities of toxicity to benthic organisms exhibited a gradient of results that exceeded 20% for multiple locations. It is expected that other sample locations (e.g., 2WSED3) with comparable COPEC mixtures and concentrations would likely exhibit similar probabilities of toxicity. A summary of the mean ERM-Quotient results is provided below.

Sample Location	ERM-Quotient	Probability of Toxicity
2WSED4	0.68	56%
2WSED17	0.55	52%
NB4SE08	0.37	45%
NF4SE13	0.16	28%
NB2SE06	0.04	3%

9. Tables: Avian and mammalian TRVs were used for the Rat snake. Across-class extrapolations in order to obtain TRVs are not advisable, particularly when no adjustments are made for body weight differences and no uncertainty factors are used. The food web calculations for crustaceans, fish, and snakes, and the resulting risk estimates should be eliminated from the document. Rather, the following approach shall be used for the assessment of risks to these receptors:

    a. Fiddler crab – The National Oceanic and Atmospheric Administration's ERL and Effects Range-Medium (ERM) values are designed to be protective of benthic organisms; these values provide a more reasonable comparison than the food-web basis currently presented. In addition, water quality criteria (WQC) are designed for the protection of not only fish, but all aquatic organisms; consequently, the use of WQC would also be appropriate for the fiddler crab.
    b. Fish (black drum and spotted sea trout) - The use of WQC is appropriate for estimation of risks to these receptors, especially given the role direct contact and gill uptake play in aquatic exposures.
    c. Rat snake - There are no appropriate TRVs for assessment of risks to the rat snake. The best that can be done for this receptor is a qualitative assessment based on a weight-of-evidence approach that considers the following questions: Is there qualitative toxicological information that indicates source-related chemicals may produce toxic effects on reptiles? Is the habitat appropriate? Are there appropriate food resources available to support a rat snake population? Are there other stressors (e.g., the road) that may pose more risk than chemical contaminants?

12. Tables 6-9: Footnote 4 on all of these tables reads "From Table 2 of EPA's EcoTox Update January, 2006." Footnote 4 should read "From Table 2 of EPA's EcoTox Update January, 1996."

13. Tables 18 and 19 Assessment and Measurement Endpoints: The measurement endpoint for mammalian and avian receptors is incorrect, and shall reflect the calculation of chemical dose and comparison to TRVs, not comparison of measured concentrations to benchmark screening values. Also, dose calculations for fish, the rat snake, and the fiddler crab are not scientifically sound due to the absence of appropriate TRVs. For fish and crab, the measurement endpoints should be redefined as the comparison of surface water or sediment concentrations to benchmarks.

14. Plate 1: Zones 1 through 4 are presented in the Intracoastal Waterway and grid patterns are presented in the north and south land areas. However, there is no discussion of these zones or grids in the text. These zones and grid features shall be referenced in the text.

References:

Long, E.R., L. J. Field and D.D. McDonald. 1998. Predicting Toxicity in Marine Sediments with Numerical Sediment Quality Guidelines. Environmental Toxicology and Chemistry, Vol. 17, No. 4, pp. 714–727.

Long, E.R. and D.D. McDonald. 1998. Perspective: Recommended Uses of Empirically Derived, Sediment Quality Guidelines for Marine and Estuarine Ecosystems. Human and Ecological Risk Assessment, Vol. 4, No. 5, pp. 1019-1039.

TCEQ. 2005. Position Paper on Common Issues Encountered During the Review of Ecological Risk Assessments. September. http://www.tceq.state.tx.us/remediation/eco/eco.html

TCEQ. 2006. Update to Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas RG-263 (Revised). January.